



Guide to Developing Nine-Element Nonpoint Source Implementation Strategic Plans in Ohio



Division of Surface Water
Surface Water Improvement Program

Version 1.1
August 30, 2016

DISCLAIMER: This guidance document will be updated as necessary to keep up with the needs of those who are authoring Nine-Element NPS-IS Plans or to provide answers to new frequently asked questions. Please note the version number and date above to assure you are using the latest version.

This page intentionally left blank

Contents

| | |
|---|----|
| Chapter 1: Overview of Watershed Planning..... | 1 |
| Watershed Based Planning (WBP) | 1 |
| Ohio’s Approach to Watershed Planning..... | 1 |
| Endorsed Watershed Action Plans (2001-2015) | 1 |
| Nonpoint Source Program Review (2013)..... | 2 |
| Nine-Element Nonpoint Source Implementation Strategic Plan (2016-present) | 3 |
| NPS-IS Plan vs. other Types of Watershed Based Plans | 4 |
| Ohio’s Nonpoint Source Management Plan Update | 5 |
| Chapter 2: Why Should We Create a <i>Nine-Element NPS-IS Plan</i> ?..... | 6 |
| Improved planning for watershed restoration | 6 |
| Build community consensus..... | 6 |
| Identification of the most needed projects | 6 |
| Grant eligibility (Section 319 & GLRI-NPS) | 6 |
| Chapter 3: Are you Ready to Write a <i>Nine-Element NPS-IS Plan</i> ? | 7 |
| Are you ready to start? | 7 |
| Do you have enough data? | 7 |
| Do you have maps or can you create them? | 8 |
| Do you have a documented need? | 9 |
| Do you have a “watershed champion”? | 9 |
| Do you have watershed partners? | 9 |
| Do you have implementers on-board? | 9 |
| Do you have Critical Areas identified? | 10 |
| Chapter 4: What Content and Format do I Use? | 11 |
| What should I include?..... | 11 |
| How do I Know my NPS-IS includes all Nine-Elements Required by U.S. EPA?..... | 12 |
| What format should I use?..... | 13 |
| Chapter 5: The NPS-IS Plan is Written, now What? | 14 |
| Review Process..... | 14 |
| A Living Document | 15 |
| Chapter 6: Frequently Asked Questions | 16 |
| How many projects are needed to make a NPS-IS Plan approvable?..... | 16 |
| I’m confused by the terms “Source” and “Cause” ... how can I easily remember which is which?..... | 16 |

| | |
|--|----|
| What makes a good critical area? | 16 |
| What if a critical area extends beyond the HUC-12 of my NPS-IS Plan?..... | 17 |
| Do I need to calculate load reductions?..... | 17 |
| Why are fish and macroinvertebrates so important?..... | 17 |
| How are loads and habitat both performance indicators? | 18 |
| What is a project? Can we include installation of a manure management structure or any other single constructed BMP as a project? | 18 |
| Can I include projects that address other issues that are not NPS related?..... | 18 |
| Who do I call with questions? | 18 |
| Works Cited | 19 |
| Index of Tables | 19 |
| Index of Figures | 19 |
| Appendix A: Acronyms and Abbreviations..... | 20 |
| Appendix B: Definitions and Explanations | 23 |
| Appendix C: Ohio Water Quality Standards (Ohio Administrative Code 3745-1)..... | 24 |
| Appendix D: Ecoregional Biological Criteria | 28 |
| Appendix E: Ohio NPS-IS Plan Administrative Review Checklist (<i>Ver. 1.1 / Aug. 2016</i>) | 32 |
| Appendix F: U.S. EPA Explanation of Nine Essential Elements (U.S. EPA, 2013) | 35 |

Chapter 1: Overview of Watershed Planning

Watershed Based Planning (WBP)

Ohio has a long history of leading WBP. The types of WBP have proliferated over the decades, and have accelerated since the passage of the Clean Water Act in 1972. Fundamentally, watershed based planning is a process that results in a document used to guide work within a geographic area defined by the flow of water. It is typically undertaken to coordinate activity related to a water resource including: water quality and/or quantity management, ecological protection and restoration, or the strategic guidance of development, infrastructure improvement, transportation, and recreation among others.

WBP continues to gain popularity because it has proven to be a successful approach to solving difficult water-related problems. The process is typically locally led, collaborative, data driven, and consensus based.

WATERSHED: a region or area bounded peripherally by a divide and draining ultimately to a particular watercourse or body of water.

– Merriam-Webster

Ohio's Approach to Watershed Planning

Endorsed Watershed Action Plans (2001-2015)

Ohio EPA developed the *Ohio Guide for Development of Watershed Action Plans* in 1997 (Guide). Subsequently, U.S. EPA section 319 program guidance issued in 2003 included the following:

To ensure that Section 319 projects succeed in restoring waters impaired by nonpoint source pollution, watershed-based plans that are developed with Section 319 funds should include the following elements...

- *An identification of the sources or groups of similar sources that will need to be controlled to achieve the load reductions established in the NPS TMDL (and to achieve any other watershed goals identified in the watershed-based plan);*
- *A description of the NPS management measures that will need to be implemented to achieve the load reductions established in the NPS TMDL (as well as to achieve other watershed goals identified in the watershed-based plan); an estimate of the load reductions expected for these management measures (recognizing the natural variability and the difficulty in precisely predicting the performance of management measures over time); and an identification of the critical areas in which those measures will need to be implemented to achieve the NPS TMDL;*
- *An estimate of the sources of technical and financial assistance needed, and/or authorities that will be relied upon, to implement the plan. As sources of funding, States should consider the use of their 319 programs, State Revolving Funds, USDA's Environmental Quality Incentives Program and Conservation Reserve Program, and other relevant Federal, State, local and private funds that may be available to assist in implementing the plan;*
- *An information/education component that will be used to enhance public understanding of the project and encourage their participation in selecting, designing, and implementing the NPS management measures;*
- *A schedule for implementing the NPS management measures identified in the plan that is reasonably expeditious.*

- *A description of interim, measurable milestones (e.g., amount of load reductions, or improvement in biological or habitat parameters) for determining whether NPS management measures or other control actions are being implemented;*
- *A set of criteria that can be used to determine whether substantial progress is being made towards attaining water quality standards and, if not, the criteria for determining whether the NPS TMDL needs to be revised.*
- *A monitoring component to evaluate the effectiveness of the implementation efforts, measured against the criteria established under item (g) immediately above.*

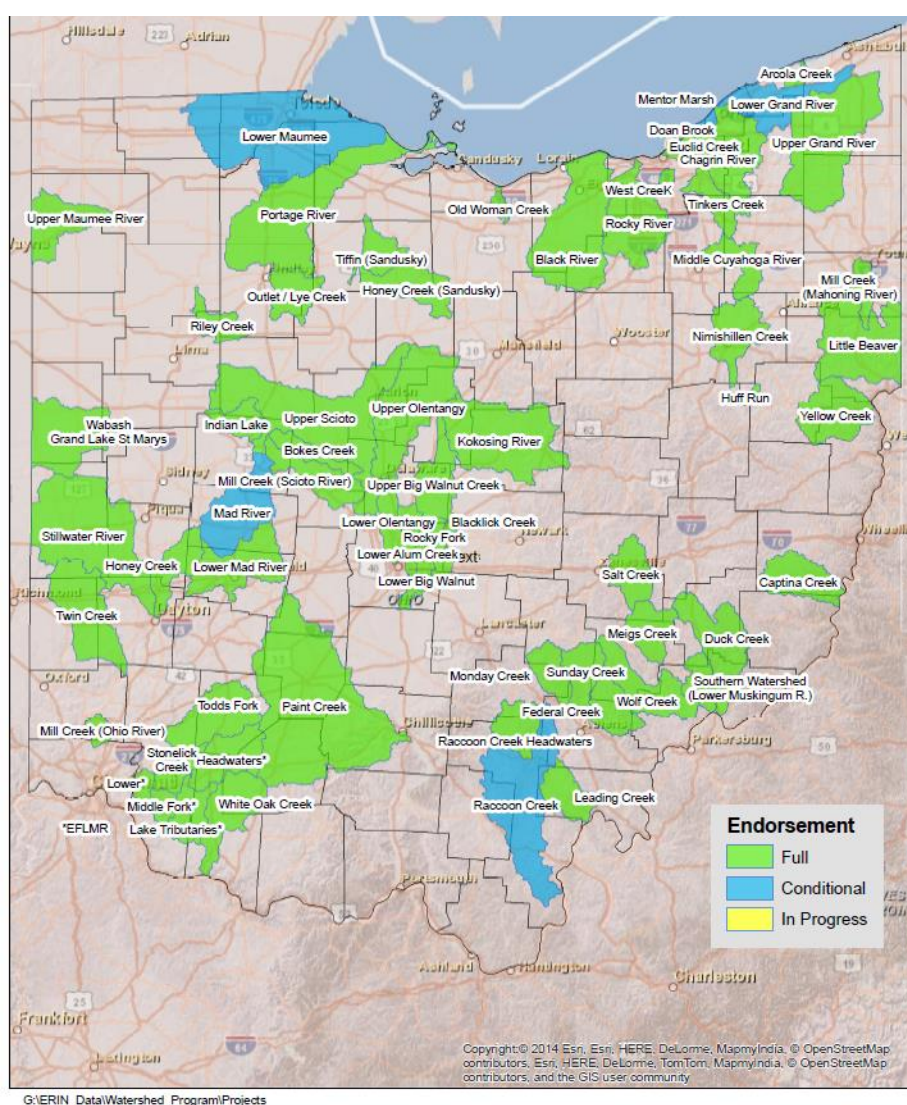
These bullet items are the precursors to the “Nine Essential Elements” (see inset below). In order to satisfy this federal guidance, Ohio EPA revised Appendix 8 of the Guide with a more detailed outline and corresponding checklist. U.S. EPA, Region V approved the revised guidance and corresponding checklist as sufficient to ensure all Ohio WAPs endorsed by Ohio EPA and partner agencies would satisfy the above referenced elements.

Ohio began supporting WAP development in earnest with initiation of the Ohio Watershed Coordinator Grant Program in 2001, and between 2004 and 2015 endorsed sixty-five (65) watershed action plans covering a significant portion of the state (Figure 1).

Nonpoint Source Program Review (2013)

Following the issuance of new Section 319 program guidance in 2013 U.S. EPA communicated to the states that beginning Federal Fiscal Year 2017 section 319 grant eligibility would be restricted to those projects supported with Nine-Element plans, and Region V began reviewing WAPs submitted to Ohio EPA for review.

Figure 1: Watershed Action Plan Endorsement Status as of 12-2-15



Feedback from U.S. EPA on Ohio's WAPs revealed that Ohio's interpretation of the "Nine Essential Elements" differed from U.S. EPA, Region V in two meaningful ways, both related to resolution and scale:

- The geographic scale of "critical areas"
- The scale at which the Nine Elements are applied

In both cases, Ohio's interpretation was determined to be too coarse. Ohio reviewed WAPs ensuring that problems, goals, objectives, and actions were developed on a 12-digit Hydrologic Unit Code (HUC-12) scale (roughly 40 square mile watersheds), whereas U.S. EPA, Region V wanted a "critical area" to be defined for each NPS pollution problem. These critical areas should be defined as specific areas within a HUC-12 (or adjacent HUC). Also, while Ohio guidance required WAPs include the nine-elements within the plan overall, U.S. EPA, Region V requires that each individual project or solution be expressed in full detail including all nine-elements.

This new interpretation of U.S. EPA, Region V has significant ramifications for watershed based planning in Ohio, and has necessitated that Ohio abandon the previous Watershed Action Plan guidance in favor of this new NPS-IS Plan guidance.

Nine-Element Nonpoint Source Implementation Strategic Plan (2016-present)

Ohio WAP development has evolved over time, and those written since 2010 are significantly more detailed, and hence, more implementable and attractive to funders. The development of the NPS-IS Plan approach continues this progression. In order to promote highly detailed and focused implementation strategies, comprehensiveness must be sacrificed. Experience has revealed that although WAPs with voluminous background and watershed inventories may serve as excellent reference documents for various audiences, they tend to be less useful for guiding efficient implementation of nonpoint source management measures.

9 ESSENTIAL ELEMENTS

- a) An identification of the causes and sources or groups of similar sources that will need to be controlled to achieve the load reductions estimated in this watershed-based plan.
- b) An estimate of the load reductions expected for the management measures described under paragraph (c) below.
- c) A description of the NPS management measures (solutions) that will need to be implemented to achieve the load reductions estimated under paragraph (b) above and an identification (using a map or a description) of the critical areas in which those measures will be needed to implement this plan.
- d) An estimate of the amounts of technical and financial assistance needed, associated costs, and/or the sources and authorities that will be relied upon, to implement this plan.
- e) An information/education component that will be used to enhance public understanding of the project and encourage their early and continued participation in selecting, designing, and implementing the NPS management measures that will be implemented.
- f) A schedule for implementing the NPS management measures identified in this plan that is reasonably expeditious.
- g) A description of interim, measurable milestones for determining whether NPS management measures or other control actions are being implemented.
- h) A set of criteria that can be used to determine whether loading reductions are being achieved over time and substantial progress is being made toward attaining water quality standards and, if not, the criteria for determining whether this watershed-based plan needs to be revised or, if a NPS TMDL has been established, whether the NPS TMDL needs to be revised.
- i) A monitoring component to evaluate the effectiveness of the implementation efforts over time, measured against the criteria established under item (h) immediately above.

A *Nine-Element Nonpoint Source Implementation Strategic Plan* (NPS-IS Plan) is a specific type of watershed based planning that will allow local entities to effectively propose and implement nonpoint source pollution projects utilizing funding made available through the Clean Water Act Section 319 (319) and the Great Lakes Restoration Initiative (GLRI). In Ohio, eligibility for these grant programs will be restricted to projects delineated within a critical area of an approved NPS-IS Plan.

According to 2013 U.S. EPA guidance, states must utilize 319 funds only for projects which include “Nine Essential Elements.” These planning components are thoroughly described in the [U.S. EPA Handbook for Developing Watershed Plans to Restore and Protect Our Waters](#). (U.S. EPA, 2008)

Ohio EPA Division of Surface Water and Ohio Department of Agriculture Division of Soil and Water Conservation collaboratively developed the NPS-IS Plan template, guidance, and related materials as a framework for efficiently updating previously endorsed Watershed Action Plans (WAPs), or utilize existing data and information, to strategically delineate well-defined nonpoint source projects supported with all “Nine Essential Elements.” The NPS-IS Plan template was approved by U.S. EPA, Region V on April 5, 2016 as an acceptable tool to guide completion of an approvable Nine-Element plan.

NPS-IS Plans are not intended to serve as or replace WAPs, but rather be appended to existing WAPs or serve as stand-alone, project focused plans.

NPS-IS Plan vs. other Types of Watershed Based Plans

As stated above, the types of watershed based plans have proliferated. Balanced Growth Watershed Plans help communities define where to concentrate development, conservation, and agriculture. Source Water Protection Plans focus on preventing contamination of drinking water wells and surface water from nonpoint source and other contaminants. Habitat Protection/Restoration Plans may be developed by land trusts and other preservation interests to prioritize areas of a watershed for property acquisition. A NPS-IS Plan may be developed in coordination with these and other types of watershed based planning efforts, but should be recognized as serving a specific purpose — **removing nonpoint source impairments** — within a larger watershed restoration effort. Some of the distinctions between WAPs and NPS-IS Plans are summarized in Table 1.

Table 1: Comparison of WAPs and NPS-IS Plan

| | WATERSHED ACTION PLANS | NPS-IS PLAN |
|------------------------------|---|---|
| Geographic Scale | HUC-10 subdivided by HUC-12 | HUC-12 with highlighted critical areas |
| Content Scope | Comprehensive and holistic | NPS specific – defined by documented impairments |
| Program Applicability | Primarily 319 - secondarily any other water restoration or protection program | Section 319 and GLRI |
| Purpose | Watershed integrity and ecosystem restoration and protection | Attain Ohio Water Quality Standards and implement TMDLs |
| Detail | Management Measures delineated with numeric targets and outcomes | Management Measures fully detailed with 9 elements – “grant proposal ready” |
| Decision Support | Emphasis on comprehensive watershed inventory | Focus on significant NPS issues with reference to documentation/data |

Ohio's Nonpoint Source Management Plan Update

Ohio's Nonpoint Source Management Plan Update (FY 2014-2018) (Update) is one of the most important plans that should be referenced in all NPS-IS Plan. Since U.S. EPA approved this Plan, all nonpoint source projects that are eligible for funding under Ohio EPA's section 319 nonpoint source program must be aligned with the Update. Likewise, all approved NPS-IS Plans must also align with the Update. The strategies in this Update explain the types of projects that Ohio EPA can fund to restore the nonpoint source impairments resulting in a critical area's inability to attain Ohio water quality standards. Therefore, the Update strategies, summarized as follows, should be used as a reference when writing a NPS-IS Plans, especially in Chapter 4.

- ***Urban Sediment and Nutrient Reduction Strategies:*** storm water runoff, and low impact development
- ***Altered Stream and Habitat Restoration Strategies:*** stream restoration, riparian habitat, flow restoration
- ***Agricultural Nonpoint Source Reduction Strategies:*** upland, livestock, and drainage mgmt.
- ***High Quality Waters Protection Strategies:*** restore and protect high quality in-stream habitat, manage invasive species.

Chapter 2: Why Should We Create a *Nine-Element NPS-IS Plan*?

Improved planning for watershed restoration

Even if your watershed partners have gone through the process of completing a Watershed Action Plan, Balanced Growth Watershed Plan, or any other WBP; completing a NPS-IS Plan will improve the integrity and expand the potential of those other document. The first WAPs endorsed in Ohio are more than 10 years old now, and what is known about watersheds has grown through the experience of implementing those plans. It has been learned that a plan is more implementable if the geographic scale and subjective scope is manageable and straightforward. It is also known that the added detail required to complete the Project Summary Sheets will make your projects “grant ready.” It is time to update your project planning efforts using the knowledge gained to improve upon your past effort.

Build community consensus

The process of developing an NPS-IS Plan may be as significant and valuable as the outcome. Through this process, partners will collect and analyze data and information together, thereby gaining a greater common familiarity with the watershed and its resources. Decision-making about the best solutions and critical areas often brings creative approaches that improve other aspects of water and land management. Individuals and entities that once viewed each other with suspicion or even hostility may become valuable allies once entrenched assumptions and positions are traded for understanding others’ legitimate interests. The general public often gains a “sense of place” that connects them to the watershed, which has immeasurable long-term benefits. Once implementation begins, a positive momentum and enthusiasm can become a groundswell of support for other programs offered by local watershed partners. We simply do a better job of getting the cart where we want to go when all the horses are pulling in the same direction.

Identification of the most needed projects

The unfortunate reality of NPS control is that there are rarely enough resources to implement every good practice everywhere. Therefore, there is no choice but to pick and choose. If this process is a last minute exercise after funding becomes available, the quality of that choice will likely suffer. The most cost-effective solutions can only be arrived at by looking at the big picture systematically. Beginning the process with good information and data available from Ohio EPA and other agencies sets this process on solid footing. By completing the Project Summary Sheets associated with the NPS-IS Plan, one will have most if not all of the information necessary to seek funding and other resources needed for implementation.

Grant eligibility (Section 319 & GLRI-NPS)

Funders are attracted to good planning. They want the funds they are managing to be used cost-effectively to solve problems. An approved Nine-Element NPS-IS Plan will ensure that funded projects are rooted in the best science available, located in the areas that will address the worst problems, and have the administrative, evaluation, and educational components needed to ensure that the resource and funder will receive the greatest long-term benefit possible.

FOR A PROJECT TO BE ELIGIBLE FOR OHIO EPA SECTION 319 FUNDING

**A proposed project must be located in a
HUC-12 where there is an U.S. EPA verified
Nine-Element NPS-IS Plan (NPS-IS plan).**

Chapter 3: Are you Ready to Write a *Nine-Element NPS-IS Plan*?

Are you ready to start?

Before you begin, contact [Rick Wilson](#), Ohio EPA, 614-644-2032 or [Greg Nageotte](#), ODA, 614-265-6619. A conversation with one of the agency review coordinators prior to beginning will keep you up to date with the latest on NPS-IS Plan development and approval, and help you avoid unnecessary or duplicative effort. You are strongly encouraged to provide drafts often! Like building a house, inspection of the foundation and structure early will help prevent costly reconstruction later.

Much of the data and many of the tools you will need to develop a NPS-IS Plan is available with a few clicks online; however, crafting a set of implementable solutions with buy-in from stakeholders is a process that benefits from some thoughtful preparation. If a Watershed Action Plan was completed in your area, it's likely that much of the organizational work has already been accomplished. An interactive map is available [here](#) to help you contact a watershed coordinator if one is employed in your area. Your local Soil and Water Conservation District is also a good place to begin networking.

Do you have enough data?

As with all watershed based planning, development of an NPS-IS Plan is a data-driven process. Planners must have enough scientifically-valid information about the watershed to identify solvable nonpoint source pollution problems, associated critical areas, and effective solutions. Fortunately, Ohio EPA and other partners are able to provide this information for most Ohio watersheds. The three most consistently available sources of water quality information will be [Total Maximum Daily Load reports \(TMDLs\) and associated Technical Support Documents](#) (TSD), and previously-endorsed [Watershed Action Plans](#).

It's important to note that it's not necessary to have all available information at hand in order to begin the planning process. Rather, one may begin with a list of well-vetted projects that will address known nonpoint source issues in the watershed.

Planners are encouraged to begin the documentation scoping process with water quality data and assessments available from Ohio EPA. Based on this initial scoping of nonpoint source problems in the watershed, additional questions may need to be further investigated, thereby necessitating aggregation of additional information to iteratively scope and refine problems, critical areas, solutions and the associated details required to delineate a clear and concise NPS-IS Plan.

Other sources of data and information may include but is not limited to:

- Federal agencies - U.S. EPA, USDA-NRCS, USGS, U.S. Army Corps of Engineers, NOAA, U.S. Fish & Wildlife Service;
- Ohio agencies - Ohio Environmental Protection Agency, Department of Natural Resources, Department of Health, and Department of Agriculture;
- Regional planning agencies - ORSANCO, TMACOG, NOACA, NEFCO, MORPC;
- Local agencies - soil and water conservation districts, health department, municipal or county planning agencies;
- Nonprofit organizations - land trusts, park districts, "friends of" groups, and lake associations;
- Academic Institutions;
- Local inventories of land use features and activities - tillage transects, windshield surveys, stream stability inventories, drainage outfall mapping, headwater habitat inventories; and
- Documentation of stakeholder knowledge - surveys, interviews, group meetings, news media, etc.

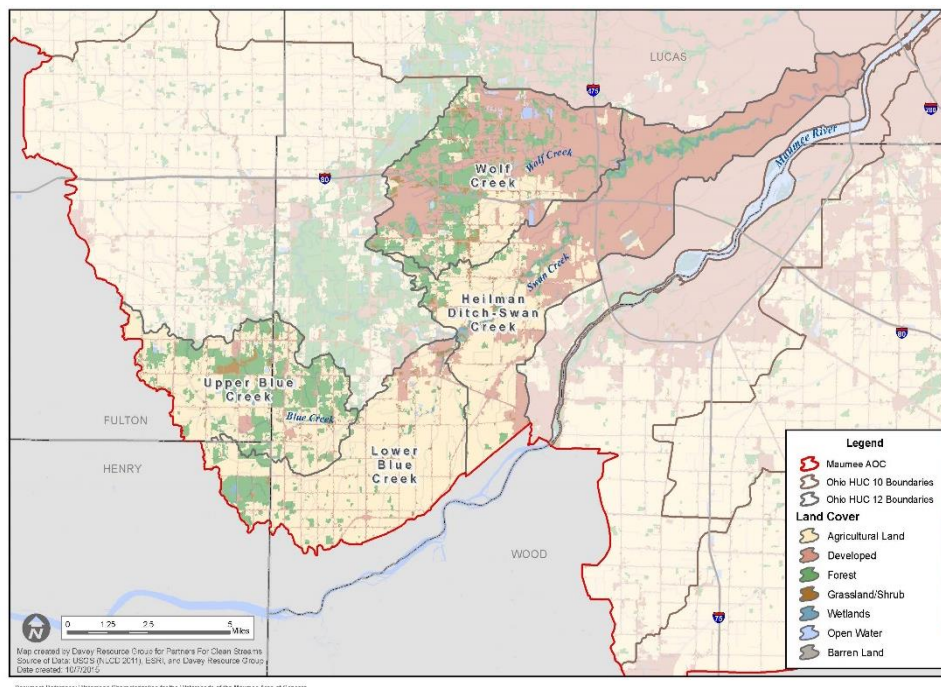
In the absence of any water quality data in the form of reports and similar documents, conclusions and decisions can often be made through analysis of the watershed itself. Is it situated in a larger basin with known nonpoint source concerns (i.e., Western Basin Lake Erie)? Are there major land use activities that typically cause nonpoint source problems? What is the condition of key aquatic habitat features (i.e., riparian forests, wetlands, floodplains, headwaters) and how well are these features connected? In urban watersheds one can investigate whether infrastructure is being affected by hydrology and erosion... typically due to the extent of poorly managed runoff from impervious surfaces.

Do you have maps or can you create them?

Geography is a central component of NPS-IS Plan development, especially when locating the NPS problem sources and critical areas, which are generally associated with specific land use features and/or activities, or physical degradation of streams and/or wetlands somewhere within the watershed.

GIS is a commonly used tool to analyze and display multiple layers of geographic data. GIS has become more user-friendly and end-user applications are affordably available. Many Soil and Water Conservation Districts and local planning agencies will have the software, data, and expertise to provide if engaged as planning partners.

Figure 2: Example Land Use map



The following are some basic maps that should be included in any NPS-IS Plan:

- **Watershed location and orientation features:** HUC-12 location within Ohio, county and municipal boundaries, major roads, and major water courses.
- **Land use:** Major land uses characterized by type including: agricultural, urban, industrial, forest, wetlands, parks, etc.
- **Physical features:** topography, detailed water features, soils, sensitive ground water recharge areas, protected lands
- **Water quality:** location of water quality monitoring sites and associated performance

Static maps saved in “pdf” format, utilizing 2010 data, were developed by Ohio Department of Natural Resources for each HUC-12, and can be made available by contacting Greg Nageotte, ODA-Division of Soil and Water Conservation by email – greg.nageotte@agri.ohio.gov

Other maps may be developed depending upon the specific nonpoint source issues in the watershed including but not limited to: ecological features, home sewage treatment distribution, specific agricultural features, i.e. highly erodible soils, maintained drainage network, source water protection areas, etc.

Although the scope of NPS-IS Plan is strictly limited to nonpoint source pollution issues, it may be useful to also highlight areas of the watershed with low potential for improvement through nonpoint source management (i.e., areas limited by point source impairments, legacy pollutants, and built-up environments). Reciprocally, it may be useful to visualize where portions of the watershed are higher quality or under protection. The ability to easily analyze and communicate the geographic character of the watershed in this manner will help refine critical areas for implementation.

Do you have a documented need?

Is your watershed (HUC-12) impaired by nonpoint sources? As stated above the NPS-IS Plan framework is designed to guide abatement of nonpoint source water quality impairments. These nonpoint source impairments and restoration needs can typically be documented with data provided by Ohio EPA, and an existing WAP may be referenced for the watershed characterization components of an NPS-IS Plan.

Do you have a “watershed champion”?

If you are reading this, perhaps you are the watershed champion... someone who will lead the planning effort and coordinate a network of people, organizations, and data; and coordinate the document drafting process. This individual may be an existing employee of an SWCD, planning agency, or nonprofit entity; or even an experienced volunteer.

Do you have watershed partners?

Although one entity will typically take the lead toward development of an NPS-IS Plan, it's difficult, if not impossible, to develop or implement an NPS-IS Plan in isolation. That being said, it's not necessary to have all potential partners at the table to initiate the process. Keeping all stakeholders informed is important for building momentum and support while minimizing unnecessary resistance due to lack of good information; however, partners may enter and exit the process depending on the specific nonpoint source problem under consideration.

The list of partners will vary depending upon the mix of land uses, demographics, activities, and institutional constituents of the watershed. Potential partners will in many ways mirror the list of entities one may consult for data and information (see above). Other partners may be able to provide leadership with outreach, education, monitoring, evaluation, tracking, and administrative needs associated with implementation. Some common partners to involve include: SWCDs, county health departments, local wildlife officer, OSU Extension, universities, and environmental groups.

WATERSHED PARTNERS

are critical to the success of watershed restoration. A variety of partners can bring a variety of expertise to a project as well as willing implementers and grant match.

Do you have implementers on-board?

In agricultural watersheds, groups of individual land owners and farmers within critical areas will likely serve as the primary implementers. They may be represented by SWCD boards or local groups such as county Farm Bureau chapters, but these will be the people invited to implement many of the solutions. Their buy-in will be essential.

Oftentimes, planners aren't adequately knowledgeable in regard to agricultural operations and the costs and management requirements of specific solutions. Effective engagement can help overcome practical barriers to implementation and find acceptable alternatives. Although education and outreach may influence the willingness of these partners to implement recommended solutions, a base level of communication and acceptance at the outset will improve adoption success.

Likewise, in urban or suburban areas of a watershed, it's important to engage neighborhood associations, local decision-makers and managers who have authority to implement change.

Land holding entities and those with regulatory or management authority over property in the watershed should be involved. These will include local, state, and federally managed parks and protected lands, and local jurisdictions including municipalities, counties, and townships.

Finally, those individuals and entities that may oppose or resist change in the watershed should also be engaged and consulted. Suspicious interests and even outspoken adversaries often become important allies when entrenched positions and assumptions give way to open communication. Consensus does not require unanimous support, but rather a general willingness to proceed when all parties can live with proposed solutions.

Do you have Critical Areas identified?

In Ohio, Critical Areas are defined as:

- An Impaired HUC-12 or area where Ohio EPA monitoring shows a nonpoint source related cause of impairment; especially those areas with identified high-magnitude causes such as habitat alteration, hydro-modification, silt/sediment, or nutrient enrichment; OR
- An area identified as having healthy waters that need protected from degradation by nonpoint source pollutants such as nutrients and sediment; especially those areas seriously threatened by the rapid conversion of countryside to developments.

In HUC-12 watersheds where Ohio EPA monitoring locations may be located near the upstream boundary of the HUC, impairments found at these locations are often caused by contributing nonpoint sources from upstream HUC-12s.

It is possible that a critical area may include area outside of the HUC-12 where the sample site is located. If a critical area must extend upstream from the HUC-12 for which you are developing a Nine-Element NPS-IS Plan, that projects in that upstream HUC-12 will not be eligible for funding from some grant sources until there is an approved Nine-Element NPS-IS Plan for that HUC-12.

When developing your NPS-IS Plan you should cross-reference "upstream critical areas" and/or "downstream impairments" in the NPS-IS Plans for those adjacent HUCs.

Chapter 4: What Content and Format do I Use?

What should I include?

As noted above, the subjective scope of an NPS-IS Plan is limited to nonpoint source pollution within a watershed. Nonpoint source pollution isn't defined in the Clean Water Act; rather it's an umbrella category of water resource pollutants and stressors not specifically regulated by the Clean Water Act. "A brief definition is that NONPOINT SOURCE pollution includes pollution caused by rainfall or snowmelt moving over and through the ground and carrying natural and human-made pollutants into lakes, rivers, streams, wetlands, estuaries, other coastal waters and ground water. Atmospheric deposition and hydrologic modification are also sources of nonpoint pollution." (U.S. EPA, 2013)

Ohio EPA categorizes nonpoint source pollution into two primary types, "polluted runoff" and "physical alterations." Polluted runoff is rain or snow melt flowing across the land picking up contaminants such as sediment, nutrients or bacteria, carrying these pollutants to small streams that eventually flow into a larger river. Physical alterations are changes made to a stream channel or stream banks and include activities such as the conversion of headwater streams into drainage ditches, constructing levees and dams, and straightening a stream to encourage improved drainage. Physical alterations also include activities such as removing trees along a river bank or installing rock rip-rap on a river bank to prevent erosion.

The primary causes of nonpoint source impairment in Ohio streams are habitat alteration, hydro-modification to stream channels, sediment and excessive nutrients. Streams in agricultural areas of Ohio appear most frequently to be impaired by physical alterations, such as ditching, and impairments caused from excessive sediment and nutrients. Streams in urban and rapidly developing residential areas of the state are further impaired by nonpoint causes such as low head dams and nonpoint source contaminants carried off land surfaces by increased storm water runoff. In the coalfield regions of southeastern Ohio, another cause of impairment is abandoned mine drainage, which has impaired more than 1,300 miles of streams in the region. (Ohio EPA, n.d.)

Fortunately, management practices to address nonpoint source pollution are becoming more effective. Previous efforts to address these types of problems often consisted of implementing demonstration practices and trying new techniques for managing the ubiquitous nature of nonpoint source pollutants. Years of trial and error are resulting in a much broader understanding of management practices needed to restore impaired waters and improve water quality. (Ohio EPA, n.d.)

Physical alterations may be addressed using restoration practices such as removing low head dams, eliminating or modifying levees and restoring floodplains and riparian forest cover. Headwater streams previously converted into drainage ditches are effectively being restored using natural stream channel design techniques. Polluted runoff is being more effectively reduced using pollution prevention practices such as replacing failing home sewage treatment systems, installing riparian filter strips and controlled drainage systems or restoring ditches to 2-stage channels to allow for more natural stream function. Many other practices designed to slow the flow of nutrients from croplands, and sediment from mining sites and construction sites are also available to improve the health of Ohio's rivers and streams.

Many watersheds in Ohio have "watershed coordinators." These individuals are formalized watershed champions by their employment and associated responsibilities. Many were originally supported with grants from Ohio EPA, ODNR, and/or ODA. You may want to contact a watershed coordinator if one exists in your watershed by consulting this [interactive map](#).

How do I Know my NPS-IS includes all Nine-Elements Required by U.S. EPA?

The nine-elements are included in a sidebar above. With the adequate completion of a Project Summary Sheet (PSS) in your NPS-IS Plan, you should have all Nine-Elements captured. Not all of the projects listed in your Project Overview Table need to have a PSS, but only those that have completed PSS will be considered eligible for funding. To ensure this the Ohio NPS-IS Plan Template was developed as summarized in Table 2.

Table 2: Where are US EPA's Nine Elements found in Ohio's NPS-IS Plan? (Thomas, 2015)

| CRITERIA | US EPA DEFINITION | OHIO EPA INTERPRETATION | LOCATION IN THE OHIO TEMPLATE |
|----------|--|---|----------------------------------|
| a | Identify the causes and sources of pollution that need to be controlled | Identify the causes and sources of pollution that need to be controlled from NPS pollution by Critical Area | 3.2.3, 3.3.3 ... etc. 4.2 |
| b | Determine load reductions needed | Determine measurable improvements needed to meet WQS— (biological, physical) and/or load reductions (pollutant). <u><i>A lot more often than not, nonpoint source related non-attainment of Water Quality Standards in Ohio rivers is the result of Low Biological or Physical index scores — not measured load.</i></u> | 3.2.4, 3.2.4 ... etc. 4.2 |
| c | Describe management measures to achieve improvements in targeted critical areas | Define critical areas, as well as the Goals & Objectives (aka management measures) including numbers (i.e., how many linear feet of bank stabilization) necessary to improve conditions of the critical area (i.e. explain where water quality is impaired and what type of project is needed to improvement WQ; MUST be based on causes and sources within the HUC-12). | 3.2.4, 3.2.4 ... etc. 4.2. |
| d | Identify technical and financial assistance and authorities needed to implement the plan | Identify technical and financial assistance and authorities needed to implement the project should include maintenance as appropriate. | 4.1, 4.2 |
| e | Develop an information/education component | Develop an information/ education component for each project | 4.2 |
| f | Develop implementation schedule | All project types are reference in "Project & Implementation Strategy Overview Table". More details are provided on the shorter term projects on Project Summary Sheets, less detail is provided on the longer term concept projects. Terms are defined as: - Short-Term (Priority) (1-3 yrs.) - Medium Term (3-7 yrs.) - Long Term (7+ yrs.) - Ongoing (annual events) | 4.1, 4.2 |
| g | Describe the interim, measureable milestones | Describe the project's measureable milestones toward improvement of the critical area, including % or amount implemented (i.e. host 2 public workshops, install 1500' of stream restoration, 15% or 32lbs reduction in phosphorus annually) | 4.2 |
| h | Identify indicators to measure progress | Identify indicators to measure progress (e.g., WQS indices (biological, physical) and/or load reductions (chemical)) and how they will be measured | 4.2 |
| i | Develop monitoring component. | Develop monitoring component based on indicators determined in criteria h. (i.e., IBI, MIwb, ICI, QHEI) | 4.2 |

What format should I use?

- An example NPS-IS Plan has been developed as a convenient guide. You are encouraged to use this example for formatting your NPS-IS Plan, especially the font, margins, table of contents (outline), and tables.
- Use the simplest format possible to tell your story... what are the NPS problems that can be fixed, where are the most significant sources of those problems, and how may those problems be solved. Reviewers and users of the NPS-IS Plan will appreciate fewer pages to read and absorb. Note that the example NPS-IS Plan includes recommendations regarding the expected length of each specific section in paragraphs rather than pages.
- Whenever possible, convey information visually using maps, illustrations, tables and graphs with the least amount explanatory text necessary. When possible, summarize text with bullets.
- In today's digitally connected world, there is no expectation or frequent need to print a NPS-IS Plan. Therefore, avoid cutting and pasting existing documentation into your NPS-IS Plan, but rather reference by hyperlink.

Chapter 5: The NPS-IS Plan is Written, now What?

Review Process

1. When you and your local partners have your NPS-IS Plan ready for approval review, deliver a single document in both “pdf” and “doc(x)” formats on CD/DVD to:
Ohio EPA-DSW-Surface Water Improvement Program
Attention: Rick Wilson
P.O. Box 1049
Columbus, OH 43216-1049
Files less than 25 MB may be emailed to: rick.wilson@epa.ohio.gov
2. The NPS-IS Plan will receive a preliminary Administrative Review to ensure reviewers’ time is used efficiently to evaluate a complete and professionally composed document. Although glaring grammar and spelling errors may be noted by reviewers, this level of review is not an efficient use of state resources. It is strongly recommended that a qualified copy editor review the NPS-IS Plan locally prior to submission.
3. The NPS-IS Plan will be distributed to reviewers. Ohio Reviewers will include Ohio EPA-Division of Surface Water, Ohio Department of Agriculture-Division of Soil and Water Conservation and (where appropriate) other appropriate professionals within Ohio (i.e., ODNR Coastal Management, Ohio EPA AOC Program).
4. Ohio Reviewers will compare the submitted NPS-IS Plan to the State of Ohio NPS-IS Plan Review Checklist included in Appendix E and document comments.
5. Detailed revision requirements and recommendations will be communicated to the primary author of the NPS-IS Plan. Comments will relate to the required nine-elements, assist in better aligning the NPS-IS Plan with current programs and policies, and improve the overall quality of the document for use and implementation.
6. Iterations of review, comment, revision, and re-review may occur until all reviewers agree to recommend submittal of the NPS-IS Plan to U.S. EPA. This means each Ohio Reviewer confirms that all elements of the State of Ohio NPS-IS Plan Review Checklist are satisfied, and overall, the document may serve as a functional tool to guide effective and efficient nonpoint source abatement in the HUC-12. Re-review will focus on whether comments are adequately addressed, and additional comments will be discouraged. When submitting a “Revision Stage” NPS-IS Plan it must include an “Index of Changes” as a separate attachment corresponding with the reviewers’ response comments.
7. Ohio EPA will then provide the NPS-IS Plan to U.S. EPA, Region V for Nine-Element Verification. The Ohio NPS-IS Review Checklist was developed in part to ensure that all Ohio NPS-IS Plans conform to U.S. EPA “Nine Essential Elements” of a watershed based plan. Ohio’s goal is to submit NPS-IS Plans of sufficient quality and completeness so that no comments or requests for revision are received from U.S. EPA, Region V.
8. Once received, U.S. EPA Nine-Element Verification of the NPS-IS Plan will be communicated to the authors by Ohio EPA via email and/or other correspondence, and its status will be communicated publicly via the Ohio EPA Web Site along with other approved NPS-IS.

A Living Document

Like any WBP, an NPS-IS Plan is intended to serve as a “living document.” Although stages of completion and approval may be achieved, your NPS-IS Plan should never be considered complete or final until attainment of Ohio water quality standards in the HUC-12 is unimpeded by solvable nonpoint source pollution problems. The NPS-IS Plan review process described above includes reference to NPS-IS Plan “stage.” Those stages are described as follows:

First Final Draft: No NPS-IS Plan has been developed for the relevant HUC-12 prior to this document. The final draft is considered to be a finished product by authors, local partners and implementers. It conforms to the Ohio NPS-IS Plan Template, has been reviewed for grammar and spelling, and requires no additional formatting. There are no blanks or holding places, and the table of contents, tables, figures, and references are accurate. The document is condensed into single “pdf” and “doc” documents.

Revision: This NPS-IS Plan is a First Final Draft to have been reviewed by Ohio agencies, and re-submitted for a subsequent review with all agency comments and recommendations incorporated. As noted in step 8 above, a Revision Stage NPS-IS Plan must include an “Index of Changes” as a separate attachment corresponding with the agency response comments.

Nine-Element Verification: U.S. EPA Region V reviews in order to verify the NPS-IS sufficiently includes all nine-elements required by Federal guidance.

Data Update: When a HUC-12 with a Nine-Element Approved NPS-IS Plan is the subject of a stream assessment or TMDL development or update, or other significant water quality or land use analysis, it will be necessary to also update relevant portions of the NPS-IS Plan. A Data Update review will not include the addition of projects.

Project Update: As new data and implementation progress warrants, a Project Update may be undertaken and submitted for review. Because the core of an NPS-IS Plan is the collection of Project Summary Sheets (PSS), keeping these up to date will ensure the NPS-IS Plan is truly a living document. The addition of one or more PSS will necessitate an expedited review. Completion of projects should be indicated on the appropriate PSS with a corresponding summary of how the project was completed, but do not remove PSS from the NPS-IS Plan. A Project Update review will not include the addition of new data.

It is permissible to submit an updated draft of your NPS-IS Plan that includes both new data and new projects. This would constitute a **Data and Project Update** review. Including an “Index of Changes” as a separate attachment will help to expedite the review of your updated NPS-IS Plan.

Chapter 6: Frequently Asked Questions

How many projects are needed to make a NPS-IS Plan approvable?

As few as one, preferably enough to completely address at least a single nonpoint source impairment, if not multiple impairments. Projects should be well connected to the documented and described nonpoint source problems/impairments.

I'm confused by the terms "Source" and "Cause" ... how can I easily remember which is which?

A "Cause" of non-attainment of water quality standards will always reference a specific pollutant or stressor measured by Ohio EPA (i.e., sediment, nutrients, habitat alteration, organic enrichment/oxygen depletion). Every "Cause" will have a "Source" or multiple sources. Sources describe the origin/land use activity responsible for the non-attainment (i.e., row crop agriculture, livestock, urban storm water, unknown). There is additional information regarding definitions and website links in Appendix C.

What makes a good critical area?

Critical areas must have a clear geographic connection to the specific "sources" of NPS pollution or physical impairments in the watershed. The type of critical area will vary depending upon both the problem and identified solutions. Where is the pollutant coming from and where should practices be installed? Narrowing the geographic scope of implementation will greatly improve cost-effectiveness of funded projects.

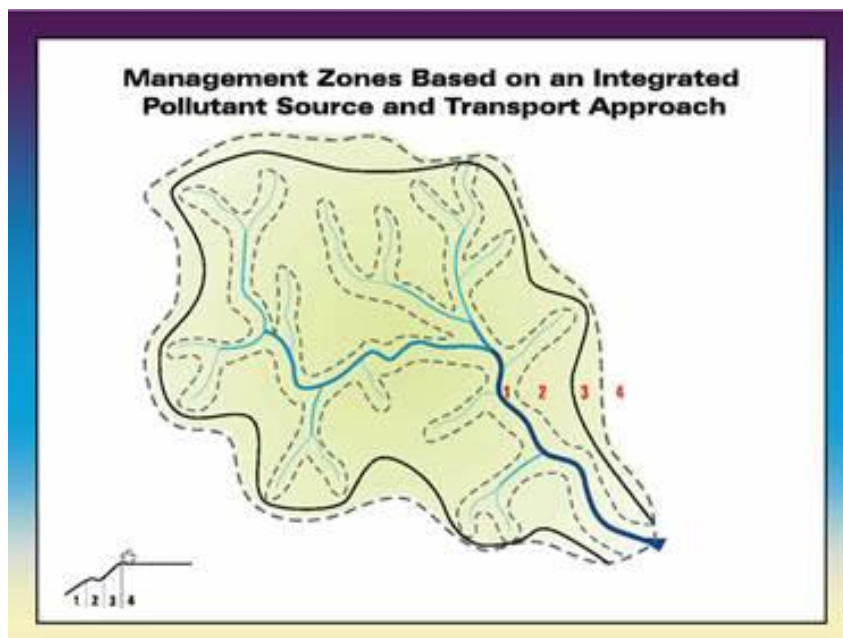
Some examples of critical areas include:

- Areas where polluting land use activities are clustered within the HUC-12
- Relevant feature classifications such as soil type or imperviousness
- Proximity to water courses or other sensitive watershed features such as wetlands
- Sections of stream with known impaired habitats and channel modifications may be identified as critical areas for restoration
- Areas with high development pressure may be identified as critical areas for protection efforts

Critical areas may also be expressed as nested implementation zones where different combinations of technical, financial and outreach assistance would be made available depending upon an identified need. For example, the management approach for zone 1 would require a landowner to install BMPs that control surface runoff (through treatment and storage) and source reduction (pollution prevention), zone 2 would be reducing surface runoff through storage and source reduction, zone 3 the focus is source reduction.

These zones would also correspond to different eligibility for assistance with the most assistance being available in

Figure 3: Management Zone Approach to Critical Areas (Davenport, 2006)



zone 1 (financial, technical and information) and least in zone 3 (information). This approach has several advantages: everyone in the watershed is eligible for some type of assistance, helps build support for the watershed management plan, and resources are targeted based management zones to increase their effectiveness. (Davenport, 2006)

What if a critical area extends beyond the HUC-12 of my NPS-IS Plan?

Because HUC-12s are somewhat arbitrarily defined subunits of watersheds and all watersheds are nested within larger watersheds up to 2-digit HUCs, it stands to reason that a source of a HUC-12 impairment may originate and aggregate from one or more upstream HUC-12s. This may occur when addressing issues closer to the upstream boundary of a HUC-12. Therefore, when developing a NPS-IS Plan you may cross-reference “upstream critical areas” and/or “downstream impairments” in adjacent HUC-12s—even though they are not located within the relevant HUC-12 NPS-IS Plan. In cases where this occurs, Section 319 grant funding may only be used for a project if both HUC-12s have an approved NPS-IS Plan. A nonpoint source pollution problem with a critical area that extends too far beyond the relevant HUC-12 may be in a practical sense “unsolvable” by local partners associated with a specific NPS-IS Plan and coordination at a larger scale will be needed.

Do I need to calculate load reductions?

U.S. EPA asks that estimates of load reductions be provided for every proposed project. So there will be a “box” to input these estimates in project summary sheets. However, based on an agreement (08/15/16) with U.S. EPA-Region 5, ***it is not a requirement to document load reductions as a measurement of progress, if habitat and biological measures are used instead.*** The State of Ohio measures water quality based on the health of the streams through the use of habitat and biological indices. In most cases, these multimetric indices are the appropriate measurement of progress toward attainment of a watershed’s designated use.

Why are fish and macroinvertebrates so important?

Attainment and non-attainment of aquatic life use of water quality standards is determined by using biological criteria as outlined in Ohio Administrative Code 3745-1-07. The biological community performance measures that are used to determine attainment or non-attainment for each of the habitat types are the Index of Biotic Integrity (IBI) and the Modified Index of Well-Being (MIwb), both of which are based on fish community characteristics, and the Invertebrate Community Index (ICI) which is based on macroinvertebrate community characteristics. The quality of the physical habitat is evaluated using the Qualitative Habitat Evaluation Index (QHEI) developed by Ohio EPA for streams and rivers in Ohio. Various attributes of the available habitat are scored based on the relative importance of each to the existence of viable, diverse aquatic faunas. Evaluations of the type and quality of substrate, amount of in-stream cover, channel morphology, extent of riparian canopy, pool and riffle development and quality, and stream gradient are among the metrics used to determine the QHEI score which generally ranges from 20 to 100 in Ohio.

Habitat characteristics appeared to have some of the strongest effects on the aquatic biota and should be a major consideration in developing nonpoint source pollution abatement strategies where the objective is to restore and protect beneficial aquatic life uses. Sediment sensitive habitat features such as a lack of substrate and riffle embeddedness and a high degree of channel development (i.e., riffle-pool-run sequences) and stability were positively correlated with IBI scores.

Because habitat is a critical component stream function, habitat data must be considered as an integral part of any attempt to restore aquatic life in a stream or river if such efforts are to succeed. Implementation of Best Management Practices (BMPs) to reduce upland erosion without consideration of channel condition or other habitat limitations will not be sufficient to restore aquatic life uses such that WQS are attained, even though overall sediment and nutrient loadings may be reduced. Similarly, reductions in upland erosion rates may be insufficient if bank erosion and riparian interactions are not concurrently addressed. Habitat management

efforts should focus on maintaining and restoring the riparian functions that are often lost when streams are channelized or riparian areas are otherwise encroached upon. (Ohio EPA, 1999)

How are loads and habitat both performance indicators?

In previous watershed plans load reductions were how performance and progress were usually measured. In the NPS-IS Plans there is a greater emphasis on measuring progress with biological indices; however, loading calculations can still be used when necessary or desired. Often, the stressor agents are direct manipulations of the physical habitat via riparian modification, dredging, and channelization. Because direct measures of habitat quality (physical measures and biological indices) exist, monitoring data can be used to determine success or failure of implementation strategies. In addition, the BMPs necessary to restore habitat quality are well known and include the protection and enhancement of natural features and processes. The specific measures needed to restore habitat quality and whether such activities are cost effective or acceptable will vary regionally. Some of this regional variation is related to soils and stream geomorphology.

What is a project? Can we include installation of a manure management structure or any other single constructed BMP as a project?

In the context of a NPS-IS Plan, a project will involve implementation of a solution (aka., management measure, BMP, practice) within a pre-defined critical area with a connection to specific causes and sources of non-attainment.

A single, site-specific project may solve a significant NPS problem for an entire HUC-12, but this is relatively rare. When introducing a new solution, a single or few demonstrations may be warranted, but in order to significantly address an NPS problem we must typically implement systematically over a larger critical area.

Can I include projects that address other issues that are not NPS related?

Water resource management is one of humanity's most complex endeavors; and the social, economic, and political framework within which we attempt to perform that management is equally complex. In order to make gains in any specific aspect of water management, we are forced by our limited intellect to compartmentalize. Therefore, the scope of NPS-IS development is strictly limited to addressing nonpoint source related problems.

However, a flood control project that improves the floodplain connectivity to a stream will improve nonpoint source assimilation. A bridge construction that incorporates design features that maintain the integrity of the natural channel and prevents erosion will also reduce sedimentation and improve biologic performance. A drainage improvement project may be designed to increase habitat and reduce stagnant conditions at low flow. Urban and residential development plans may be improved by adding NPS pollution reduction elements. With these and other potential examples, it stands to reason that all water related projects contemplated by local partners may be considered for their nonpoint source reducing or mitigating benefits and incorporated into the NPS-IS accordingly.

That being said, inclusion of standalone projects of these types is less appealing than a well-thought aggregation of similar practices or site-specific projects into a larger project across the HUC-12 with a well-defined critical area connected to documented causes and sources of nonattainment. In other words, standalone projects can typically be put into a larger context to formulate a more impactful project with many potential sites.

Who do I call with questions?

Contact [Rick Wilson](#), Ohio EPA, 614-644-2032; or [Greg Nageotte](#), ODA, 614-265-6619 with any questions.

Works Cited

- Davenport, T. (2006). Targeting Critical Areas and Scheduling Implementation”, Targeting Critical Areas and Scheduling Implementation”, Management Zones Based on an Integrated Pollutant Source and Transport Approach. *Human Dimensions of Water Management*, (p. Slide 18).
- Ohio EPA. (1999). *Association Between Nutrients, Habitat, and the Aquatic Biota in Ohio Rivers and Streams (Technical Bulletin MAS/1999-1-1)* . Columbus. Retrieved from Ohio EPA: http://epa.ohio.gov/portals/35/documents/assoc_load.pdf
- Ohio EPA. (2016). *Delisting Guidance and Restoration Targets for Ohio Areas of Concern*. Columbus: Ohio EPA.
- Ohio EPA. (n.d.). *Nonpoint Source Pollution Control Program*. Retrieved 6 3, 2016, from Ohio EPA - NWDO: <http://www.epa.state.oh.us/dsw/nps/index.aspx>
- Thomas, P. (2015, 11 02). Watershed Coordinator. (R. Gibson, Interviewer)
- U.S. EPA. (2008, March). *Handbook for Developing Watershed Plans to Restore and Protect Our Waters*. Retrieved June 10, 2016, from U.S. EPA: <https://www.epa.gov/polluted-runoff-nonpoint-source-pollution/handbook-developing-watershed-plans-restore-and-protect>
- U.S. EPA. (2013, April 12). *Nonpoint Source Program and Grants Guidelines for States and Territories*. Retrieved June 10, 2016, from U.S. EPA: <https://www.epa.gov/sites/production/files/2015-09/documents/319-guidelines-fy14.pdf>
- U.S. EPA. (2015, November 17). *Ohio's Tiered Aquatic Life Use Designations Turn 20 Years Old*. Retrieved from Water Quality Criteria: <https://www.epa.gov/wqc/ohios-tiered-aquatic-life-use-designations-turn-20-years-old>
- U.S. EPA. (2015, November 17). *Providing Evidence of Water Quality Improvements in Ohio*. Retrieved from Water Quality Criteria: <https://www.epa.gov/wqc/providing-evidence-water-quality-improvements-ohio>
- U.S. EPA. (2016, August 29). *Nonpoint Source Program and Grants Guidelines for States and Territories (April 2013)*. Retrieved from U.S. EPA: <https://www.epa.gov/sites/production/files/2015-10/documents/319-guidelines-fy14.pdf>

Index of Tables

| | |
|--|----|
| Table 1: Comparison of WAPs and NPS-IS Plan..... | 4 |
| Table 2: Where are US EPA’s Nine Elements found in Ohio’s NPS-IS Plan? (Thomas, 2015)..... | 12 |

Index of Figures

| | |
|--|----|
| Figure 1: Watershed Action Plan Endorsement Status as of 12-2-15 | 2 |
| Figure 2: Example Land Use map | 8 |
| Figure 3: Management Zone Approach to Critical Areas (Davenport, 2006) | 16 |

Appendix A: Acronyms and Abbreviations

The acronyms and abbreviations below are commonly used by organizations working to restore Ohio's watersheds.

A

AOC Area of Concern

B

BMP Best Management Practice
BOD Biochemical Oxygen Demand

C

CDF Confined Disposal Facility
CSO Combined Sewer Overflow
CWH Coldwater Habitat

D

DDE DDT metabolite
DDT Banned pesticide associated with bird and animal deformities and reproductive problems
DELT Deformities, Eroded Fins, Lesions, and Tumors
DNR Department of Natural Resources

E

EIS Environmental Impact Study
EOLP Erie-Ontario Lake Plain Ecoregion
ESA Environmental Site Assessment
EWH Exceptional Warmwater Habitat

G

GIS Geographical Information System
GLWQA Great Lakes Water Quality Agreement

H

HELP Huron-Erie Lake Plain Ecoregion
Hg Mercury
HUC Hydrologic Unit Code

I

IBI Index of Biotic Integrity
ICI Invertebrate Community Index
IJC International Joint Commission

L

LaMP Lakewide Management Plan
LOEC Lowest Observable Effect Concentration
LRW Limited Resource Water

M

| | |
|------|------------------------------|
| Mg/l | Milligrams per Liter |
| MGD | Million Gallons per Day |
| MIwb | Modified Index of Well Being |
| MWH | Modified Warmwater Habitat |

N

| | |
|-------|---|
| NOEC | No Observable Effect Concentration |
| NPDES | National Pollutant Discharge Elimination System |

O

| | |
|------|--------------------------------------|
| ODA | Ohio Department of Agriculture |
| ODNR | Ohio Department of Natural Resources |
| ODH | Ohio Department of Health |

P

| | |
|-----|----------------------------------|
| PAH | Polycyclic Aromatic Hydrocarbons |
| PCB | Polychlorinated Biphenyls |
| PEL | Probable Effect Level |

Q

| | |
|------|--------------------------------------|
| QHEI | Qualitative Habitat Evaluation Index |
|------|--------------------------------------|

R

| | |
|-----|----------------------|
| RAP | Remedial Action Plan |
|-----|----------------------|

S

| | |
|------|--------------------------------------|
| SSO | Sanitary Sewer Overflow |
| SWCD | Soil and Water Conservation District |

T

| | |
|------|---------------------------------|
| TEL | Threshold Effect Level |
| TMDL | Total Maximum Daily Load Limits |
| TSD | Technical Support Document |

U

| | |
|-------|---|
| µg/kg | Micrograms per Kilogram |
| USACE | United States Army Corps of Engineers |
| USDA | United States Department of Agriculture |
| USEPA | United States Environmental Protection Agency |
| USFWS | United States Fish and Wildlife Service |
| USGS | United States Geological Survey |
| USPC | United States Policy Committee |

V

| | |
|-----|--------------------------|
| VAP | Voluntary Action Program |
|-----|--------------------------|

W

| | |
|------|---|
| WAP | Watershed Action Plan |
| WBP | Watershed Based Plan |
| WC | Watershed Characterization |
| WQ | Water Quality |
| WQS | Water Quality Standards (Ohio Administrative Code 3745-1) |
| WRAS | Watershed Restoration Action Strategy |
| WWH | Warmwater Habitat |
| WWTP | Wastewater Treatment Plant |

Appendix B: Definitions and Explanations

Time Frame for Implementation (used in NPS-IS Plan Chapter 4)

Short term: These projects should be/are expected to be implemented in Year 1-3

Medium term: These projects should be/are expected to be implemented in Years 3-7

Long term: These projects should be/are expected to be implemented in Year 7 and beyond

Ranking of Projects (used in NPS-IS Plan Chapter 4)

PRIORITY: The PRIORITY designation indicates the importance of immediate action and should be used for the most important short term projects. Immediate action may be needed due to issues such as:

- Highly threatened by development pressures or loss of full attainment status;
- Would achieve a high reduction in the loading percentage of nitrogen, phosphorus and/or fecal coliform/e. coli; and
- A publicly owned or accessible area in most need of protection.

Definitions

Goals: A measured parameter or index (i.e. Index of Biotic Integrity score)

Objectives: What can be done to restore the impaired measured parameter (i.e. Increase bank stabilization)

Sources of Impairment: 1) The most prominent origins of the "agents" deemed responsible for the observed aquatic life use impairment.

(Ohio EPA Integrated Report 2014 Glossary, Ohio EPA website:

<http://wwwapp.epa.ohio.gov/gis/mapportal/IR2014Glossary.html>)

2) The activities, facilities or conditions that generate the pollutants including: municipal sewage treatment plants, factories, storm sewers, modifications of hydrology, agricultural runoff, etc.)

(2002 National Assessment Database: Assessing Water Quality Q&A, US EPA web site: http://www.epa.gov/waters/305b/assessing_quality.html)

Cause(s) of Impairment: 1) The most prominent "agents" deemed responsible for the observed aquatic life use impairment

and should be the initial focus of restoration activities or TMDL development within the watershed.

(Ohio EPA Integrated Report 2014 Glossary, Ohio EPA website:

<http://wwwapp.epa.ohio.gov/gis/mapportal/IR2014Glossary.html>)

2) What is keeping the waters from meeting the criteria adopted to protect the designated uses including: chemical contaminants (i.e. PCBs, metals, etc), physical conditions (i.e. temperature, excess siltation, alterations of habitat, etc.), and biological contaminants (i.e. bacteria, noxious aquatic weeds).

(2002 National Assessment Database: Assessing Water Quality Q&A, US EPA web site: http://www.epa.gov/waters/305b/assessing_quality.html)

In Ohio, Critical Areas are defined as:

- An Impaired HUC-12 or area where Ohio EPA monitoring shows a nonpoint source related cause of impairment; especially those areas with identified high-magnitude causes such as habitat alteration, hydromodification, silt/sediment, or nutrient enrichment; OR
- An area identified as having healthy waters that need protected from degradation by nonpoint source pollutants such as nutrients and sediment; especially those areas seriously threatened by the rapid conversion of countryside to developments.

Appendix C: Ohio Water Quality Standards (Ohio Administrative Code 3745-1)

Water quality standards contain two distinct elements: designated uses and numerical or narrative criteria designed to protect and measure attainment of the uses. Rules 3745-1-01 to 3745-1-07 of the Ohio Water Quality Standards apply to all surface waters of the State of Ohio. Rules 3745-1-08 to 3745-1-30 define the use designations applicable to the river and stream segments around the state. Additional chemical-specific criteria applicable within the Lake Erie drainage basin are contained in rules 3745-1-31 and 3745-1-33. The water quality criteria applicable to a specific water body are determined by identifying the use designations assigned to that water body in Rules 3745-1-08 to 3745-1-30, then referring to Rule 3745-1-07 and 3745-1-33 for criteria protective of those use designations. The following are excerpts from OAC 3745-1.

OAC 3745-1-01 Purpose and Applicability

- (A) It is the purpose of these water quality standards, Chapter 3745-1 of the Administrative Code, to establish minimum water quality requirements for all surface waters of the state, thereby protecting public health and welfare; and to enhance, improve and maintain water quality as provided under the laws of the state of Ohio, section 6111.041 of the Revised Code, the federal Clean Water Act, 33 U.S.C. section 1251 et seq., and rules adopted thereunder.
- (B) Whenever two or more use designations apply to the same surface water, the more stringent criteria of each use designation will apply.
- (C) These water quality standards will apply to all surface waters of the state except as provided in paragraph (D), (E), or (F) of this rule. Compliance schedules may be granted pursuant to rule 3745-33-05 of the Administrative Code.
- (D) These water quality standards will not apply to water bodies when the flow is less than the critical low-flow values determined in rule 3745-2-05 of the Administrative Code.
- (E) The following exceptions will apply only to the specific water quality criteria involved in each case for a reasonable period of time as determined by the director.
 - (1) Whenever chemicals are applied for control of aquatic plants or animals, notice must be given to the director before chemicals are applied. The director, upon receiving such notice, may order that chemicals not be applied if he concludes that the proposed application would pose an unreasonable danger to human or aquatic life. The application of pesticides registered under the Federal Insecticide, Fungicide and Rodenticide Act (7 U.S.C. 136 et seq.) are permitted without notification to the director when:
 - (a) The pesticide is applied consistent with label instructions; and
 - (i) The application is to a pond with a surface area equal to or less than five acres; and
 - (ii) The application is not within one mile upstream of a public water supply intake or within one mile of a reservoir public water supply intake; and
 - (iii) The application is not to any wetland, borrow pit, quarry or water body used for public swimming.
 - (b) The pesticide is applied under the direction of a local health department or other government agency in a mosquito abatement program.
 - (2) Whenever dredging or construction activities occur on or near water bodies or during the period of time when the aftereffects of dredging or construction activities degrade water quality and such activities have been authorized by the United States army corps of engineers and/or by a 401 water quality certification or an isolated wetland permit issued by the Ohio environmental protection agency.
 - (3) Whenever coal re-mining permits are issued pursuant to section 301(p) of the act. This exception applies to pH, iron and manganese for the duration of the re-mining activity. This exception applies only if: there is a demonstrated potential for improved water quality from the re-mining operation; and no degradation of existing instream conditions occurs.

- (F) Temporary variances. The director may grant temporary variances from compliance with water quality criteria applicable by this chapter pursuant to rule 3745-33-07 of the Administrative Code.

3745-1-07 Water Use Designations and Statewide Criteria

(This section is NOT included in its entirety)

- (A) Water quality standards contain two distinct elements: designated uses; and numerical or narrative criteria designed to protect and measure attainment of the uses.

- (1) Each water body in the state is assigned one or more aquatic life habitat use designations. Each water body may be assigned one or more water supply use designations and/or one recreational use designation. These use designations are defined in paragraph (B) of this rule. Water bodies are assigned use designations in rules 3745-1-08 to 3745-1-32 of the Administrative Code. In addition, water bodies are assigned designations as described in paragraphs (B)(1)(a), (B)(1)(c), (B)(3)(a), (B)(4)(a) and (B)(4)(b) of this rule and in the antidegradation rule (rule 3745-1-05 of the Administrative Code).
-

- (6) Biological criteria presented in table 7-15 of this rule provide a direct measure of attainment of the warmwater habitat, exceptional warmwater habitat and modified warmwater habitat aquatic life uses. Biological criteria and the exceptions to chemical-specific or whole-effluent criteria allowed by this paragraph do not apply to any other use designations.
-

- (B) Use designations are defined as follows:

- (1) Aquatic life habitat

- (a) "Warmwater" - these are waters capable of supporting and maintaining a balanced, integrated, adaptive community of warmwater aquatic organisms having a species composition, diversity, and functional organization comparable to the twenty-fifth percentile of the identified reference sites within each of the following ecoregions: the interior plateau ecoregion, the Erie/Ontario lake plains ecoregion, the western Allegheny plateau ecoregion and the eastern corn belt plains ecoregion. For the Huron/Erie lake plains ecoregion, the comparable species composition, diversity and functional organization are based upon the ninetieth percentile of all sites within the ecoregion. For all ecoregions, the attributes of species composition, diversity and functional organization will be measured using the index of biotic integrity, the modified index of well-being and the invertebrate community index as defined in "Biological Criteria for the Protection of Aquatic Life: Volume II, User's Manual for Biological Field Assessment of Ohio Surface Waters," as cited in paragraph (B) of rule 3745-1-03 of the Administrative Code. In addition to those water body segments designated in rules 3745-1-08 to 3745-1-32 of the Administrative Code, all upground storage reservoirs are designated warmwater habitats. Attainment of this use designation (except for upground storage reservoirs) is based on the criteria in table 7-15 of this rule. A temporary variance to the criteria associated with this use designation may be granted as described in paragraph (F) of rule 3745-1-01 of the Administrative Code.

- (b) "Limited warmwater" - these are waters that were temporarily designated in the 1978 water quality standards as not meeting specific warmwater habitat criteria. Criteria for the support of this use designation are the same as the criteria for the support of the use designation warmwater habitat. However, individual criteria are varied on a case-by-case basis and supersede the criteria for warmwater habitat where applicable. Any exceptions from warmwater habitat criteria apply only to specific criteria during specified time periods and/or flow conditions. The adjusted criteria and conditions for specified stream segments are denoted as comments in rules 3745-1-08 to 3745-1-30 of the Administrative Code. Stream segments currently designated limited warmwater

habitats will undergo use attainability analyses and will be redesignated other aquatic life habitats. No additional stream segments will be designated limited warmwater habitats.

- (a) "Exceptional warmwater" - these are waters capable of supporting and maintaining an exceptional or unusual community of warmwater aquatic organisms having a species composition, diversity, and functional organization comparable to the seventy-fifth percentile of the identified reference sites on a statewide basis. The attributes of species composition, diversity and functional organization will be measured using the index of biotic integrity, the modified index of well-being and the invertebrate community index as defined in "Biological Criteria for the Protection of Aquatic Life: Volume II, User's Manual for Biological Field Assessment of Ohio Surface Waters," as cited in paragraph (B) of rule 3745-1-03 of the Administrative Code. In addition to those water body segments designated in rules 3745-1-08 to 3745-1-32 of the Administrative Code, all lakes and reservoirs, except upground storage reservoirs, are designated exceptional warmwater habitats. Attainment of this use designation (except for lakes and reservoirs) is based on the criteria in table 7-15 of this rule. A temporary variance to the criteria associated with this use designation may be granted as described in paragraph (F) of rule 3745-1-01 of the Administrative Code.
- (b) "Modified warmwater" - these are waters that have been the subject of a use attainability analysis and have been found to be incapable of supporting and maintaining a balanced, integrated, adaptive community of warmwater organisms due to irretrievable modifications of the physical habitat. Such modifications are of a long-lasting duration (i.e., twenty years or longer) and may include the following examples: extensive stream channel modification activities permitted under sections 401 and 404 of the act or Chapter 6131. of the Revised Code, extensive sedimentation resulting from abandoned mine land runoff, and extensive permanent impoundment of free-flowing water bodies. The attributes of species composition, diversity and functional organization will be measured using the index of biotic integrity, the modified index of well-being and the invertebrate community index as defined in "Biological Criteria for the Protection of Aquatic Life: Volume II, User's Manual for Biological Field Assessment of Ohio Surface Waters," as cited in paragraph (B) of rule 3745-1-03 of the Administrative Code. Attainment of this use designation is based on the criteria in table 7-15 of this rule. Each water body designated modified warmwater habitat will be listed in the appropriate use designation rule (rules 3745-1-08 to 3745-1-32 of the Administrative Code) and will be identified by ecoregion and type of physical habitat modification as listed in table 7-15 of this rule. The modified warmwater habitat designation can be applied only to those waters that do not attain the warmwater habitat biological criteria in table 7-15 of this rule because of irretrievable modifications of the physical habitat. All water body segments designated modified warmwater habitat will be reviewed on a triennial basis (or sooner) to determine whether the use designation should be changed. A temporary variance to the criteria associated with this use designation may be granted as described in paragraph (F) of rule 3745-1-01 of the Administrative Code.
- (c) "Seasonal salmonid" - these are rivers, streams and embayments capable of supporting the passage of salmonids from October to May and are water bodies large enough to support recreational fishing. This use will be in effect the months of October to May. Another aquatic life habitat use designation will be enforced the remainder of the year (June to September). A temporary variance to the criteria associated with this use designation may be granted as described in paragraph (F) of rule 3745-1-01 of the Administrative Code.

- (f) "Coldwater" - these are waters that meet one or both of the characteristics described in paragraphs (B)(1)(f)(i) and (B)(1)(f)(ii) of this rule. A temporary variance to the criteria associated with this use designation may be granted as described in paragraph (F) of rule 3745-1-01 of the Administrative Code.
- (i) "Coldwater habitat, inland trout streams" - these are waters which support trout stocking and management under the auspices of the Ohio department of natural resources, division of wildlife, excluding waters in lake run stocking programs, lake or reservoir stocking programs, experimental or trial stocking programs, and put and take programs on waters without, or without the potential restoration of, natural coldwater attributes of temperature and flow. The director shall designate these waters in consultation with the director of the Ohio department of natural resources.
- (ii) "Coldwater habitat, native fauna" - these are waters capable of supporting populations of native coldwater fish and associated vertebrate and invertebrate organisms and plants on an annual basis. The director shall designate these waters based upon results of use attainability analyses.
- (g) "Limited resource water" - these are waters that have been the subject of a use attainability analysis and have been found to lack the potential for any resemblance of any other aquatic life habitat as determined by the biological criteria in table 7-15 of this rule. The use attainability analysis must demonstrate that the extant fauna is substantially degraded and that the potential for recovery of the fauna to the level characteristic of any other aquatic life habitat is realistically precluded due to natural background conditions or irretrievable human-induced conditions. For water bodies in the Lake Erie drainage basin, the designation of water bodies as limited resource waters shall include demonstrations that the "Outside Mixing Zone Average" water quality criteria and values and chronic whole effluent toxicity levels are not necessary to protect the designated uses and aquatic life pursuant to rule 3745-1-35 of the Administrative Code. All water body segments designated limited resource water will be reviewed on a triennial basis (or sooner) to determine whether the use designation should be changed. Limited resource waters are also termed nuisance prevention for some water bodies designated in rules 3745-1-08 to 3745-1-30 of the Administrative Code. A temporary variance to the criteria associated with this use designation may be granted as described in paragraph (F) of rule 3745-1-01 of the Administrative Code. Waters designated limited resource water will be assigned one or more of the following causative factors. These causative factors will be listed as comments in rules 3745-1-08 to 3745-1-30 of the Administrative Code.
- (i) "Acid mine drainage" - these are surface waters with sustained pH values below 4.1 s.u. or with intermittently acidic conditions combined with severe streambed siltation, and have a demonstrated biological performance below that of the modified warmwater habitat biological criteria.
- (ii) "Small drainageway maintenance" - these are highly modified surface water drainageways (usually less than three square miles in drainage area) that do not possess the stream morphology and habitat characteristics necessary to support any other aquatic life habitat use. The potential for habitat improvements must be precluded due to regular stream channel maintenance required for drainage purposes.
- (iii) Other specified conditions.
-

Appendix D: Ecoregional Biological Criteria

Attainment and non-attainment of aquatic life use is determined by using biological criteria as outlined in Ohio Administrative Code 3745-1-07. The aquatic life uses found in Ohio's Areas of Concern are:

Warm Water Habitat (WWH)

This use designation defines the "typical" warmwater assemblage of aquatic organisms for Ohio rivers and streams; this use represents the principal restoration target for the majority of water resource management efforts in Ohio.

Exceptional Warm Water Habitat (EWH)

This use designation is reserved for waters which support "unusual and exceptional" assemblages of aquatic organisms which are characterized by a high diversity of species, particularly those which are highly intolerant and/or rare, threatened, endangered, or special status (i.e., declining species); this use designation represents a protection goal for water resource management efforts dealing with Ohio's best water resources. Biological criteria for EWH apply uniformly across the state.

Modified Warm Water Habitat (MWH)

This use applies to streams and rivers which have been subjected to extensive, maintained, and essentially permanent hydromodifications such that the biocriteria for the WWH use are not attainable and where the activities have been sanctioned and permitted by state and/or federal law; the representative aquatic assemblages are generally composed of species which are tolerant to low dissolved oxygen, silt, nutrient enrichment, and poor quality habitat. Biological criteria for MWH were derived from a separate set of habitat modified reference sites and are stratified across five ecoregions and three major modification types: channelization, run-of-river impoundments, and extensive sedimentation due to non-acidic mine drainage.

Coldwater Habitat (CWH)

This use is intended for waters which support assemblages of cold water organisms and/or those which are stocked with salmonids with the intent of providing put-and-take fishery on a year round basis which is further sanctioned by the Ohio Department of Natural Resources (ODNR) Division of Wildlife; this use should not be confused with the Seasonal Salmonid Habitat (SSH) use which applies to the Lake Erie tributaries which support periodic "runs" of salmonids during the spring, summer, and/or fall. No specific biological criteria have been developed for the CWH use although the WWH biocriteria are viewed as attainable for CWH designated streams.

Limited Resource Water Habitat (LRW)

This use applies to small streams (usually <3 sq. mi. drainage area) and other water courses which have been irretrievably altered to the extent that no appreciable assemblage of aquatic life can be supported. Such waterways generally include small streams in extensively urbanized areas, those which lie in watersheds with extensive drainage modifications, those which completely lack water on a recurring annual basis (i.e., true ephemeral streams), or other irretrievably altered waterways.

Seasonal Salmonid Habitat (SSH)

This use applies to rivers, streams and embayments capable of supporting the passage of salmonids from October to May, and includes water bodies large enough to support recreational fishing. This use will be in effect the months of October to May. Another aquatic life habitat use designation will be enforced the remainder of the year (June to September). A temporary variance to the criteria associated with this use designation may be granted as described in paragraph (F) of rule 3745-1-01 of the Administrative Code.

The biological community performance measures that are used to determine attainment or non-attainment for each of these habitat types are the Index of Biotic Integrity (IBI) and the Modified Index of Well-Being (MIwb), both of which are based on fish community characteristics, and the Invertebrate Community Index (ICI) which is based on macroinvertebrate community characteristics. IBI and ICI are multi-metric indices patterned after an original IBI described by Karr (1981) and Fausch et al. (1984). The MIwb is a measure of the fish community abundance and diversity using numbers and weight information from a variety of Midwest Rivers (Gammon 1976, Gammon et al. 1981). The MIwb is a modification of the Index of Well-Being (IWB) and corrects the problem of relatively high scores at degraded sites. Thirteen highly pollution tolerant species, exotics and hybrids are eliminated from the numbers and biomass components of the IWB, but the tolerant and exotic species are included in the Shannon Index component of the MIwb calculations. The modification eliminates the undesired effect caused by high abundance (in both numbers and biomass) of tolerant species, but retains the influence in the Shannon indices.

Criteria for each biological index are specified for each of Ohio's five ecoregions and are used in conjunction with chemical and whole effluent toxicity evaluation methods and criteria to monitor and assess the condition of the state's surface waters. (U.S. EPA, 2015) In Ohio, biological data and definition of regional reference conditions have led to a stratification of expectations for streams and rivers. The aquatic life use designations are assigned to individual waterbody segments based upon the potential to support that use according to narrative and numerical criteria. To determine the use attainment status at each sampling location, the following guidelines are used:

- ***FULL ATTAINMENT***: A use is considered to be fully attained when all of the biological indices meet the biocriteria value for the applicable use designation, ecoregion, and site type. Values that are within the nonsignificant departure range (4 IBI or ICI units; 0.5 MIwb units) are considered to meet the biocriteria.
- ***PARTIAL ATTAINMENT***: A use is considered to be partially attained if one or two biological indices indicate attainment, but others do not; for the EWH and WWH use designations, the biological indices that fail to meet the applicable biocriteria must at least be within the fair range of performance.
- ***NON-ATTAINMENT ATTAINMENT***: A use is not attained if all of the biological indices fail to meet the biocriteria, or if either organism group reflects poor or very poor performance, even if the other organism group meets the biocriteria. (U.S. EPA, 2015)

The quality of the physical habitat is evaluated using the Qualitative Habitat Evaluation Index (QHEI) developed by Ohio EPA for streams and rivers in Ohio. Various attributes of the available habitat are scored based on the relative importance of each to the existence of viable, diverse aquatic faunas. Evaluations of the type and quality of substrate, amount of in-stream cover, channel morphology, extent of riparian canopy, pool and riffle development and quality, and stream gradient are among the metrics used to determine the QHEI score which generally ranges from 20 to 100 in Ohio.

The QHEI is used to evaluate the characteristics of a stream segment, as opposed to only the habitat characteristics of a single sampling site. As such, individual sites may have poorer physical habitat due to localized disturbances yet still support aquatic communities closely resembling those sampled at adjacent sites with better habitat, provided that water quality conditions are not limiting. QHEI scores from hundreds of segments throughout the state have indicated that values greater than 60 are generally conducive to existence of warmwater faunas. Scores greater than 75 frequently typify habitat conditions that have the ability to support exceptional warmwater faunas.

The following table includes the IBI, ICI, MIwb, and QHEI criteria based on the aquatic life habitat use designation and the ecoregion for each stream. Ecoregions are classification of the landscape by region. They are large landscape areas defined by climate, physical characteristics of the landscape, and the plants and animals that are able to live there. Ecoregions contain many different physical settings and biological communities, which occur in predictable patterns. (Ohio EPA, 2016)

The table below includes the biological criteria for warmwater, exceptional warmwater and modified warmwater habitats. Description and derivation of indices and ecoregions are contained in *Biological Criteria for the Protection of Aquatic Life: Volume II, User's Manual for Biological Field Assessment of Ohio Surface Waters* cited in paragraph (B) of rule 3745-1-03 of the Administrative Code. These criteria do not apply to the Ohio River, lakes or Lake Erie river mouths.

| Index | Sample site | Ecoregion ¹ | Modified Warmwater Habitat | | | Warmwater Habitat | Exceptional Warmwater Habitat |
|---|-------------|------------------------|----------------------------|------------------|-----------|-------------------|-------------------------------|
| | | | Channel Modification | Mine Effectuated | Impounded | | |
| (A) Index of Biotic Integrity (IBI) (fish) | | | | | | | |
| (1) Wading sites ² | | HELP | 22 | -- | -- | 32 | 50 |
| | | IP | 24 | -- | -- | 40 | 50 |
| | | EOLP | 24 | -- | -- | 38 | 50 |
| | | WAP | 24 | 24 | -- | 44 | 50 |
| | | ECBP | 24 | -- | -- | 40 | 50 |
| (2) Boat sites ² | | HELP | 20 | -- | 22 | 34 | 48 |
| | | IP | 24 | -- | 30 | 38 | 48 |
| | | EOLP | 24 | -- | 30 | 40 | 48 |
| | | WAP | 24 | 24 | 30 | 40 | 48 |
| | | ECBP | 24 | -- | 30 | 42 | 48 |
| (3) Headwater sites ³ | | HELP | 20 | -- | -- | 28 | 50 |
| | | IP | 24 | -- | -- | 40 | 50 |
| | | EOLP | 24 | -- | -- | 40 | 50 |
| | | WAP | 24 | 24 | -- | 44 | 50 |
| | | ECBP | 24 | -- | -- | 40 | 50 |
| (B) Modified Index of Well-Being (MIwb) (fish) ⁴ | | | | | | | |
| (1) Wading sites ² | | HELP | 5.6 | -- | -- | 7.3 | 9.4 |
| | | IP | 6.2 | -- | -- | 8.1 | 9.4 |
| | | EOLP | 6.2 | -- | -- | 7.9 | 9.4 |
| | | WAP | 6.2 | 5.5 | -- | 8.4 | 9.4 |
| | | ECBP | 6.2 | -- | -- | 8.3 | 9.4 |

| Index | Sample site | Ecoregion ¹ | Modified Warmwater Habitat | | | Warmwater Habitat | Exceptional Warmwater Habitat |
|---|-------------|------------------------|----------------------------|------------------|-----------|-------------------|-------------------------------|
| | | | Channel Modification | Mine Effectuated | Impounded | | |
| (2) Boat sites ² | | HELP | 5.7 | -- | 5.7 | 8.6 | 9.6 |
| | | IP | 5.8 | -- | 6.6 | 8.7 | 9.6 |
| | | EOLP | 5.8 | -- | 6.6 | 8.7 | 9.6 |
| | | WAP | 5.8 | 5.4 | 6.6 | 8.6 | 9.6 |
| | | ECBP | 5.8 | -- | 6.6 | 8.5 | 9.6 |
| (C) Invertebrate Community Index (ICI) (macroinvertebrates) | | | | | | | |
| (1) Artificial Substrate samplers ² | | HELP | 22 | -- | -- | 34 | 46 |
| | | IP | 22 | -- | -- | 30 | 46 |
| | | EOLP | 22 | -- | -- | 34 | 46 |
| | | WAP | 22 | 30 | -- | 36 | 46 |
| | | ECBP | 22 | -- | -- | 36 | 46 |

1 HELP = Huron/Erie lake plain ecoregion. IP = interior plateau ecoregion. EOLP = Erie/Ontario lake plain ecoregion.

WAP = western Allegheny plateau ecoregion. ECBP = eastern corn belt plains ecoregion.

2 Sampling methods descriptions are found in the "Manual of Ohio EPA Surveillance Methods and Quality Assurance Practices," cited in paragraph (B) of rule 3745-1-03 of the Administrative Code.

3 Modification of the IBI that applies to sites with drainage areas less than twenty square miles.

4 Does not apply to sites with drainage areas less than twenty square miles.

Appendix E: Ohio NPS-IS Plan Administrative Review Checklist (Ver. 1.1 / Aug. 2016)

State of Ohio Nine-Element Nonpoint Source Implementation Strategic Plan Review Checklist

Name of Author and/or Organization: _____

Name of Document and version: _____

HUC-12 Name and Number(s): _____

Type of Review: *(check one)* Data Review: ☐ Project Review: ☐

Date Submitted for Review: _____

Date Comments provided to Author: *(if necessary)* _____

Date of Resubmission: *(if necessary)* _____

Date Approved: _____

Required Reviewers: _____

Additional Reviewers: _____

NOTE: If more than one HUC-12 is submitted for review at the same time (i.e., all 12-digit HUCs within a 10-digit HUC), each HUC-12 NPS-IS Plan will be reviewed separately.

Acknowledgement

| Yes | No | <i>(check which type of review was completed)</i> |
|-----|----|---|
| | | <i>This section was reviewed for a Data Review</i> |
| | | <i>The section was reviewed for a Project Review</i> |
| | | Are organizations and individuals who assisted in the development of the NPS-IS identified? |
| | | Comments: |

Chapter 1: Introduction

| Yes | No | <i>(check which type of review was completed)</i> |
|-----|----|--|
| | | <i>This section was reviewed for a Document Review</i> |
| | | <i>The section was reviewed for a Project Review</i> |
| | | Is background provided on why this NPS-IS plan was created? |
| | | Are maps provided and are they sufficient to illustrate watershed location? |
| | | Is sufficient background information provided (i.e., name of watershed, counties, towns, cities.)? |
| | | Is a brief history of the watershed provided? |
| | | Is information about the authoring organization provided? |
| | | Was there sufficient stakeholder input in the development of this NPS-IS plan? |
| | | Comments: |

Chapter 2: HUC-12 Watershed Characterization and Assessment Summary

| Yes | No | (check which type of review was completed) |
|-----|----|--|
| | | <i>This section was reviewed for a Data Review</i> |
| | | <i>The section was reviewed for a Project Review</i> |
| | | Is the summarized watershed characterization and assessment summary referenced? |
| | | Are physical and natural features of the HUC-12 described/summarized? |
| | | Are maps/tables provided and sufficient to illustrate applicable NPS issues for the physical & natural features of the HUC-12? |
| | | Is the land use and public/protected land within the HUC-12 described? |
| | | Are maps/tables provided and sufficient to illustrate applicable NPS issues for land use & public/protected lands? |
| | | Are biological trends summarized and are informational sources referenced for the HUC-12? |
| | | Are maps/tables provided and sufficient to illustrate applicable NPS issues for biological trends and conditions? |
| | | Is a summary of the NPS causes and associated sources provided including informational reference(s)? |
| | | Are maps/tables provided and sufficient to illustrate applicable NPS issues of causes and associated sources? |
| | | Is there a summary of partial and/or non-attainment locations in the HUC-12 and is it correlated to the causes/sources? |
| | | Are maps/tables or other images provided to illustrate NPS related partial or non-attainment? |
| | | Does the information/maps/tables provided explain how the critical area(s) were determined? |
| | | Comments: |

Chapter 3: Critical Area Conditions & Restoration Strategies

| Yes | No | (check which type of review was completed) |
|-----|----|--|
| | | <i>This section was reviewed for a Data Review</i> |
| | | <i>The section was reviewed for a Project Review</i> |
| | | Is there a detailed relevant characterization of the features of <u>each</u> selected critical area? If no, explain: |
| | | Are images, maps and/or tables provided and sufficient to illustrate the characterization? |
| | | Is there a detailed description of the biological conditions of <u>each</u> selected critical area? If no, explain: |
| | | Are images, maps and/or tables provided and sufficient to illustrate the biological conditions? |
| | | Does the description provided details on how far the critical area is from attainment of the aquatic life use target? If no, explain: |
| | | Is there a detailed description of the Causes and Sources identified as contributing to the partial or non-attainment in <u>each</u> identified critical area? If no, explain: |
| | | Are images, maps and/or tables provided and sufficient to illustrate the NPS causes and sources? |

Chapter 3: Critical Area Conditions & Restoration Strategies (continued)

| | | |
|--|--|---|
| | | Is an explanation provided that outlines the goals and objectives to address the NPS impairment(s) for each critical area? |
| | | Are the goals provided and do they quantify the over-arching need in order to address a measured parameter/cause(s) of impairment? |
| | | Are objectives provided and do they quantify the technical solutions that need to be implemented and how much in order to eliminate the associated source(s)? |
| | | Was a numbering system developed for goals, objectives and related projects? |
| | | Comments: |

Chapter 4: Projects and Implementation Strategy

| Yes | No | (check which type of review was completed) |
|-----|----|--|
| | | <i>This section was reviewed for a Data Review</i> |
| | | <i>The section was reviewed for a Project Review</i> |
| | | Is there a "Projects and Implementation Overview Table" provided for each critical area? |
| | | Is each column completed correctly for each described project? |
| | | Is a Project Summary Sheet provided for each project described as "short term" in the Overview table? |
| | | Is each individual Project Summary Sheet complete (meeting 9-minimum elements) and accurate? If not, which elements are insufficient or missing? |
| | | Comments: |

Additional Reviewer comments: _____

Does Reviewer recommend approval: Yes ☐ No ☐

If no, explain: _____

Reviewer Signature: _____ **Date:** _____

Reviewer Name: (please print) _____

Appendix F: U.S. EPA Explanation of Nine Essential Elements (U.S. EPA, 2013)

The information (including underlined text) below is an excerpt that was provided by U.S. EPA-Region 5. It was suggested by the Region that this document be attached to Ohio EPA's guidance "to show people exactly (the) requirements they have to meet." The entire guidance document: "*Nonpoint Source Program and Grants Guidelines for States and Territories, April 12, 2013*" can be found at <https://www.epa.gov/sites/production/files/2015-10/documents/319-guidelines-fy14.pdf>

Appendix C – Continued Element a.

Identification of causes of impairment and pollutant sources or groups of similar sources that need to be controlled to achieve needed load reductions, and any other goals identified in the watershed plan. Sources that need to be controlled should be identified at the significant subcategory level along with estimates of the extent to which they are present in the watershed (e.g., X number of dairy cattle feedlots needing upgrading, including a rough estimate of the number of cattle per facility; Y acres of row crops needing improved nutrient management or sediment control; or Z linear miles of eroded streambank needing remediation).

What does this mean?

Your WBP source assessment should encompass the watershed of the impaired waterbody(ies) throughout the watershed, and include map(s) of the watershed that locates the major cause(s) and source(s) of impairment in the planning area. To address these impairments, you will set goals to meet (or exceed) the appropriate water quality standards for pollutant(s) that threaten or impair the physical, chemical, or biological integrity of the watershed covered in the plan.

This element will usually include an accounting of the significant point and nonpoint sources in addition to the natural background levels that make up the pollutant loads causing problems in the watershed. If a TMDL or TMDLs exist for the waters under consideration, this element may be adequately addressed in those documents. If not, you will need to conduct a similar analysis (which may involve mapping, modeling, monitoring, and field assessments) to make the link between the sources of pollution and the extent to which they cause the water to exceed relevant water quality standards.

Element b.

An estimate of the load reductions expected from management measures.

What does this mean?

On the basis of the existing source loads estimated for element a, you will similarly determine the reductions needed to meet water quality standards. After identifying the various management measures that will help to reduce the pollutant loads (see element c below), you will estimate the load reductions expected as a result of implementing these management measures, recognizing the difficulty in precisely predicting the performance of management measures over time.

Estimates should be provided at the same level as that required in the scale and scope described in element a (e.g., the total load reduction expected for dairy cattle feedlots, row crops, eroded streambanks, or implementation of a specific stormwater management practice). For waters for which TMDLs have been approved or are being developed, the plan should identify and incorporate the TMDLs; the plan needs to be designed to achieve the applicable load reductions in

the TMDLs. Applicable loads for downstream waters should be included so that water delivered to a downstream or adjacent segment does not exceed the water quality standards for the pollutant of concern at the water segment boundary. The estimate should account for reductions in pollutant loads from point and nonpoint sources identified in the TMDL as necessary to attain the applicable water quality standards.

Element c.

A description of the nonpoint source management measures that will need to be implemented to achieve load reductions in element b, and a description of the critical areas in which those measures will be needed to implement this plan.

What does this mean?

The plan should describe the management measures that need to be implemented to achieve the load reductions estimated under element b, as well as to achieve any additional pollution prevention goals outlined in the watershed plan (e.g., habitat conservation and protection). Pollutant loads will vary even within land use types, so the plan should also identify the critical areas¹⁷ (¹⁷critical areas are those producing disproportionately high pollutant loads) in which those measures will be needed to implement the plan. This description should be detailed enough to guide needed implementation activities throughout the watershed and can be greatly enhanced by developing an accompanying map with priority areas and practices. Thought should also be given to the possible use of measures that protect important habitats (e.g. wetlands, vegetated buffers, and forest corridors) and other non-polluting areas of the watershed. In this way, waterbodies would not continue to degrade in some areas of the watershed while other parts are being restored.

Element d.

Estimate of the amounts of technical and financial assistance needed, associated costs, and/or the sources and authorities that will be relied upon to implement this plan.

What does this mean?

You should estimate the financial and technical assistance needed to implement the entire plan. This includes implementation and long-term operation and maintenance of management measures, information/education (I/E) activities, monitoring, and evaluation activities. You should also document which relevant authorities might play a role in implementing the plan. Plan sponsors should consider the use of federal, state, local, and private funds or resources that might be available to assist in implementing the plan. Shortfalls between needs and available resources should be identified and addressed in the plan.

Element e.

An information and education component used to enhance public understanding of the plan and encourage their early and continued participation in selecting, designing, and implementing the nonpoint source management measures that will be implemented.

What does this mean?

The plan should include an I/E component that identifies the education and outreach activities or actions that will be used to implement the plan. These I/E activities may support the adoption and long-term operation and maintenance of management practices and support stakeholder involvement efforts.

Element f.

Schedule for implementing the nonpoint source management measures identified in this plan that is reasonably expeditious.

What does this mean?

You should include a schedule for implementing the management measures outlined in your watershed plan. The schedule should reflect the milestones you develop in g and you should begin implementation as soon as possible. Conducting baseline monitoring and outreach for implementing water quality projects are examples of activities that can start right away. It is important that schedules not be “shelved” for lack of funds or program authorities; instead they should identify steps towards obtaining needed funds as feasible.

Element g.

A description of interim measurable milestones for determining whether nonpoint source management measures or other control actions are being implemented.

What does this mean?

The WBP should include interim, measurable implementation milestones to measure progress in implementing the management measures. These milestones will be used to track implementation of the management measures, such as whether they are being implemented according to the schedule outlined in element f, whereas element h (see below) will develop criteria to measure the effectiveness of the management measures by, for example, documenting improvements in water quality. For example, a watershed plan may include milestones for a problem pesticide found at high levels in a stream. An initial milestone may be a 30% reduction in measured stream concentrations of that pesticide after 5 years and 50 percent of the users in the watershed have implemented Integrated Pest Management (IPM). The next milestone could be a 40% reduction after 7 years, when 80% of pesticide users are using IPM. The final goal, which achieves the water quality standard for that stream, may require a 50% reduction in 10 years. Having these waypoints lets the watershed managers know if they are on track to meet their goals, or if they need to re-evaluate treatment levels or timelines.

Element h.

A set of criteria that can be used to determine whether loading reductions are being achieved over time and substantial progress is being made toward attaining water quality standards.

What does this mean?

As projects are implemented in the watershed, you will need water quality benchmarks to track progress towards attaining water quality standards. The criteria in element h (not to be confused with water quality criteria in state regulations) are the benchmarks or waypoints to measure against through monitoring. These interim targets can be direct measurements (e.g., fecal coliform concentrations, nutrient loads) or indirect indicators of load reduction (e.g., number of beach closings). These criteria should reflect the time it takes to implement pollution control measures, as well as the time needed for water quality indicators to respond, including lag times (e.g., water quality response as it is influenced by ground water sources that move slowly or the extra time it takes for sediment bound pollutants to break down, degrade or otherwise be isolated from the water column). Appendix B of these guidelines, “Measures and Indicators of Progress and Success,” although intended as measures for program success, may provide some examples that may be useful. You should also indicate how you will determine whether the WBP needs to be revised if interim targets are not met. These revisions could involve changing management practices, updating the loading analyses, and reassessing the time it takes for pollution concentrations to respond to treatment.

Element i.

A monitoring component to evaluate the effectiveness of the implementation efforts over time, measured against the criteria established under element h.

What does this mean?

The WBP should include a monitoring component to determine whether progress is being made toward attaining or maintaining the applicable water quality standards for the waterbody(ies) addressed in the plan. The monitoring program should be fully integrated with the established schedule and interim milestone criteria identified above. The monitoring component should be designed to assess progress in achieving loading reductions and meeting water quality standards. Watershed-scale monitoring can be used to measure the effects of multiple programs, projects, and trends over time. Instream monitoring does not have to be conducted for individual BMPs unless that type of monitoring is particularly relevant to the project.

For more detailed information on developing watershed-based plans, please see *A Handbook for Developing Watershed Plans to Restore and Protect Our Waters*, U.S. EPA, EPA 841-B-08-002 March 2008, (www.water.epa.gov/polwaste/nps/handbook_index.cfm). Other resources for watershed planning are available on the Watershed Central website - including the Watershed Central Wiki and Plan Builder tool at (water.epa.gov/type/watersheds/datait/watershedcentral/index.cfm)